



## **SUBSTITUTE SPECIFICATION**

### **PALLET**

#### **Field of the Invention**

[0001] The present invention relates to pallets and in particular to a multi-purpose pallet having detachable components.

#### **Background of the Invention**

[0002] Pallets made of wood are typically used throughout the world for easy storing and transporting of goods. These pallets are generally of a square shape having an upper and lower deck made of a series of wooden planks and at least two solid wooden beams therebetween. The pallet is normally nailed together and includes slots within which a forklift's tines or other material handling devices can be located for lifting and moving the pallet.

[0003] Known pallets suffer from many disadvantages. For example, they

- are expensive to manufacture;
- require repeated repair;
- are limited to standard sizes;
- have protruding fixings or connections;
- are limited in the amount they can carry;
- are easy to damage or break;
- are heavy;
- are difficult to attach to additional components when required;
- absorb moisture, liquids and odors;
- are a fire risk;
- can have termite and insect contamination;
- splinter easily;
- have nails that can loosen; and
- have a short life span, and the timber used for them is generally from hardwood forests.

[0004] Of particular concern is that wood pallets damage easily and the repair or replacement of the pallet is expensive and time-consuming and it is usually easier to just discard the pallet. Further, wood pallets retain dirt and other undesirable substances, which minimizes their use in contamination or hygienic areas such as the food or medical industries.

[0005] Metal and plastic pallets have also been developed. These types of pallets have many disadvantages similar to wood pallets.

[0006] Accordingly, there is a need for a lightweight metal pallet that has releasably connectable parts for easy maintenance and repair, overcomes debris and contamination problems and includes no sharp edges.

### **Summary of the Invention**

[0007] It is an object of the present invention to overcome or ameliorate some of the disadvantages of the prior art, or at least to provide a useful alternative.

[0008] There is firstly disclosed herein a metal pallet having:

- a top deck;
- a bottom deck; and
- at least two elongate bearers securing the decks together;
- each bearer having a first portion and second portion, each portion extending separately between the decks and having a top web and a bottom web connected to a central web by inclined portions.

[0009] Preferably,

- the central webs of the first and second portions are releasably securable together;
- the central webs are substantially normal to the decks;
- the top and bottom webs are releasably securable to the decks;
- the webs are releasably securable to the decks and/or each other by fastening means;
- the fastening means are threaded fasteners;
- the pallet includes a plurality of holes for receiving each fastening means;
- the fastening means are welds or rivets;
- the pallet is of a generally rectangular configuration having a front edge, a rear edge and two side edges;
- at least one edge includes a cover plate;

at least one elongate bearer includes a stiffener;  
at least one bearer includes an end cap;  
the top and/or bottom deck is of a profiled configuration;  
the profiled configurations are corrugations;  
the pallet includes sheet material secured to at least one deck;  
the pallet includes cavities for receipt of tines of a forklift or other handling equipment; and  
the cavities are located on all sides of the pallet.

### **Brief Description of the Drawings**

[0010] A preferred form of the present invention will now be described, by way of example only, with reference to the accompanying drawings wherein:

[0011] Figure 1 is a partial perspective view of a bearer for a pallet of an embodiment of the present invention;

[0012] Figure 2 is a perspective view of a pallet of an embodiment of the present invention;

[0013] Figure 3 is a partial perspective view of the pallet of Figure 2 with attachments;

[0014] Figure 4 is a partial side view of the pallet of Figure 2 with attachments;

[0015] Figures 5a to 5d are cross-sectional views of bearer embodiments for a pallet of the present invention;

[0016] Figures 6a to 6c are partial side views of embodiments of the invention showing recesses for tines of a forklift;

[0017] Figures 7a and 7b are perspective views showing the four-way openings of Figures 6a to 6c; and

[0018] Figure 8 shows a cross-sectional view of an alternate embodiment of the pallet of Figure 1.

### **Description of the Preferred Embodiments**

[0019] There is disclosed herein a pallet 1 manufactured of sheet metal, typically galvanized steel or aluminum. The pallet 1 includes a top deck 5, a bottom deck 10 and at least two

elongate bearers 15 securing the decks 5, 10 together. As best seen in Figures 1, 5a to 5d and 8, each bearer 15 has a first portion 16 and a second portion 17 extending separately between the decks 5, 10 and having a top web 20 and a bottom web 25 connected to a central web 30 by inclined portions 35. In use, the webs 20, 25, 30 of the first and second portions 16, 17 are releasably securable to each other and the decks 5, 10 by fastening means 40 such as a threaded fastener which is typically located in holes 45. In the preferred form, the central webs 30 are substantially vertical or normal to the decks 5, 10. Alternatively, the fastening means 40 could be a weld or rivet, the pallet 1 easily being repaired by drilling out the weld or rivet, replacing the part and re-welding or riveting.

[0020] Typically, the portions 16, 17 of the bearers 15 are positioned abutting each other, and fastening means 40 in the form of a threaded fastener, spot welds, blind rivet or the like secure the two central webs 30 together. The pallet 1 can also include a counter-sunk bore or aperture in the holes 45 for hiding the fastening means 40 below the plane of the adjacent surfaces. This will ensure no sharp objects, such as the end of a bolt, protrude above the adjacent surface of the deck 5, 10. As best seen in Figure 3, the elongate bearer 15 can also include a stiffener strip 50 to provide further support to the bearer 15 when the pallet 1 is required for heavy loads. The stiffener strip 50 is merely attached along the central web 30 at the holes 45 for the fastening means 40. The pallet 1 can also include many additional components to provide a more profiled pallet 1. For example, the top or bottom decks 5, 10 can include profiled configurations such as corrugations as best seen in Figures 2 and 7a, 7b. Cover plates and end caps 55 or the like as seen in Figures 3 and 4 could also be utilized.

[0021] Referring specifically to Figures 1, 5a to 5c and 8, the top and bottom webs 20, 25 are load support flanges providing an opening 47 therebetween allowing access for spot welding or attaching threaded fasteners such as screws or bolts or the like. The separator of the portions 16, 17 also allows for only one side of the bearer 15 to be replaced if required. In a preferred form, the webs 20, 25 are abutting. A rounded non-sharp edge is preferably provided between the webs 20, 25 and inclined portions 35. The overall dimensions of all components can change depending upon the required pallet 1.

[0022] In Figure 2 a standard 1000 x 1200 cm pallet 1 is shown. The pallet 1 dimensions can vary to suit particular industry requirements such as 1165 x 1165 cm, for example. The decks 5, 10 can be in varying configurations, such as corrugations, flat panels, curves or the like. The corrugations, for example, can be in any direction, non-uniform, and/or a combination of

directions or shapes, depending on the load to be lifted and moved. In the embodiment shown, galvanized steel corrugations are shown providing superior strength and durability. The corrugations also provide maximum surface contact while retaining structural adequacy. However, a 100% flat surface 79 can be provided in place of the corrugations or affixed to the top of the corrugations (see Figure 4) or a combination of surfaces can be provided.

[0023] Advantages of the pallet 1 as shown herein are that all components can be disassembled and reassembled or damaged components can be easily replaced, if required. Shaped sleeves 60 (as best seen in Figure 4) made of any material could also be added to cover edges and increase strength. End caps 55 could also be added to provide a more aesthetic looking pallet 1, provide impact resistance, and cover apertures and edges at the ends of the bearers 15. If corrugations are used, an edge strip 65 could also be provided to seal in any openings for hygiene requirements. There are also shown in Figures 2, 6a to 6c, 7a and 7b, openings 75 for the tines or wheels of forklifts and pallet trucks. The pallet 1 could also include a cross member (not shown) between the bearers 15 or inside the corrugations to provide additional support for very heavy loads.

[0024] Figure 4 also shows additional componentary including a lip 77 formed in the corrugations to ensure no sharp edges and to stiffen against impact from a forklift. A separate sleeve 60 could also be provided as mentioned above. The lip 77 also provides an increase in the horizontal strength of the pallet 1. This embodiment also shows a further sheet material 79 across the top of the corrugations and a stiffener strip 50. The sheet material 79 could be galvanized steel, timber, plastic or any other material, if required.

[0025] Figures 5a to 5d and 8 show different embodiments of the bearer 15. These embodiments are utilized for different fastener combinations, allowing easy access to the bearer 15. As seen in Figures 5a and 5b, additional members 80 can be included to receive the decks 5, 10.

[0026] Figures 6a to 6c, 7a and 7b show further embodiments of the invention, detailing openings 75 in the pallet 1 for allowing four-way entry for a lifting device.

[0027] Figure 8 shows a further embodiment of the invention having fastening means 40 in the form of a screw and rivet. The webs 20 and 25 are turned inward to reduce sharp edges.

**[0028]** The pallet 1 disclosed herein can be completely disassembled as all components can be replaced individually quickly and inexpensively. Pallet 1 has extremely strong load bearing capacity due to the angles of the members making up the portions 16, 17 and has:

- structural adequacy and load distribution for rotational movements;
- a shape that can be altered in all dimensions and angles for various purposes;
- smooth non-sharp surfaces on each bearer 15 horizontal side surfaces;
- the small cross-sectional area of end which maximizes the width of openings 75 for forklift tines;

- bolted, riveted, screwed or welded fixings 40 for joins and decks 5, 10 to bearers 15;
- holes or apertures 45 recessed to allow for non-protruding fixings/connections;
- external sides with no visible joins that resist dirt collection;
- interior space that is minimized to reduce the contamination area;
- interior space small enough to enhance any cleaning pressure hose effect; and
- bearers 15 that can be galvanized steel or aluminum.

**[0029]** The additional sheet material layer 79 could be steel, timber, plastic, paperboard, composites or fibers. The steel bearers 15 for example could support timber decking and be secured by a threaded nail, bolt or the like. The bearer 15 shape allows for mid-height horizontal stiffener 50 attachment for extra heavy loads, and the bearer shape can be segmented to allow for four-way pallet option. The decks 5, 10 can be adapted to 100% coverage if pallet 1 purpose requires, and one or more additional decks 5, 10 could be added. This allows hygienic adaptability for food industry requirements. The deck board profile can have edge returns 77 roll-formed to avoid sharp edges, and a deck board sleeve 60 to stiffen end against forklift and pallet truck impact. Bearer 15 shape allows for timber deck boards if necessary, and the deck board shape can have steel strip attached to cover cavities. The deck board profile can have 45-60 degree folded ends to eliminate sharp edges, and alternatively deck boards can have horizontal angle cover attachment.

**[0030]** Although the invention has been described with reference to specific examples, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms and other structures.